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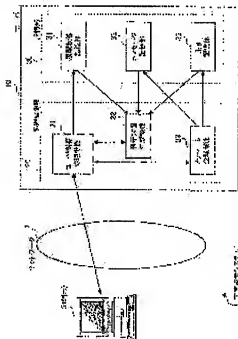
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(54) DOCUMENTS DISPLAY SYSTEM, DOCUMENTS DISPLAY METHOD AND ITS PROGRAM

(57)Abstract:

PROBLEM TO BE SOLVED: To easily grasp the inter-document relevance of threaded documents, and to simultaneously view the documents in a necessary range.
SOLUTION: This document display system is provided with a message storage part 32 for storing a message configuring a thread, an index storage part 33 for storing information associated with the configuration of the thread in the message, a development status storage part 31 for storing the development status of the message and a display document generating function 22 for extracting the index of a message from the index storage part 33, and for extracting the development status of the message from the development status storage part 31 and for generating a section corresponding to the index. A display document generating function 22 calls a predetermined message from a message storage part 32, and buries it in the section, and adds it to a display document.



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CLAIMS

[Claim(s)]

[Claim 1]

a group which minded the network and was carried out -- a document storing means to store a document,

said group stored in said document storing means -- a related information storing means to store the mutual related information in a document,

A display document generation means to read the related information stored in said related information storing means, to form a section group, to embed the document read from said document storing means to the predetermined section which constitutes the section group concerned, and to generate a display document

***** document display system.

[Claim 2]

Said display document generation means is a document display system according to claim 1 characterized by embedding the level showing the depth of the header of a document, and the hierarchy from a main sentence document, and forming said section group.

[Claim 3]

Said related information storing means is a document display system according to claim 1 characterized by storing the information on the parent document related to a predetermined document.

[Claim 4]

The message storage section which memorizes the message which constitutes a thread,

The index storage section which memorizes the information about the configuration of the thread in said message,

The index of said message is taken out from said index storage section, and it has the display document generation function which generates the section corresponding to the index concerned,

Said display document generation function is a document display system characterized by calling a predetermined message from said message storage section, embedding into a section, and adding to a display document.

[Claim 5]

It has further the expansion condition storage section which memorizes the expansion condition of said message,

Said display document generation function is a document display system according to claim 4 characterized by taking out the expansion condition of said message from said expansion condition storage section, and generating a section.

[Claim 6]

It has further the user interactive-processing function to receive the expansion demand to the header from a user,

Said display document generation function is a document display system according to claim 4 characterized by adding said predetermined message to said display document based on said expansion

demand received by said user interactive-processing function.

[Claim 7]

The step which acquires the related information between the documents in a thread from storage,
The step which generates the section group based on said related information acquired from said storage in a virtual document,

The step which reads the document corresponding to the predetermined section which constitutes said section group from storage,

The step which embeds said read document into said section, and adds it to a display document

***** document method of presentation.

[Claim 8]

Said section group is the document method of presentation according to claim 7 characterized by being generated from the document group which minded the network and was carried out.

[Claim 9]

The document in said thread is the document method of presentation according to claim 7 characterized by being the set of the document with which the edit to a document is not planned.

[Claim 10]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention]

This invention relates to the document display system which displays the thread-ized document group in more detail about the document display system which displays a document.

[0002]

[Description of the Prior Art]

In the e-mail system which exchanges a document through a network, or the notice plate system, thread-izing the document obtained by the exchange of an argument and mail, and keeping it in a document database (DB) is performed widely. At this time, according to the structure of a thread, a title is displayed as a list of a document, and the method of presentation which develops and omits a thread is mounted with much application.

[0003]

Drawing 10 is drawing having shown the example of a display of the document group which constitutes a thread. Here, to the Maine TOPICS, there are answerback (response) 1 and answerback (response) 2, there is answerback 1-1 as answerback of answerback, and there are answerback 1-1-1 and answerback 1-1-2 as this answerback 1-1 as that answerback at this answerback 1. Moreover, there is answerback 2-1 among the answerbacks 2 as answerback of this answerback. Thus, the document list in a thread is displayed by the tree structure (tree structure) in the system which exchanges a document through a network.

[0004]

As a conventional technique, for example, in order to support the synchronization by individual human being who is not located in the same location, and asynchronous communication, to make it connected with arch FEKUTO as the background for a communication link and to make a communication link possible the window of a chat is embedded into the related part in the document for a chat, and the technique which carries out support of the communication link client to the location of the arbitration in arch FEKUTO, the related location, for example, the word processor document, in a document, exists (for example, patent reference 1 reference --) .

[0005]

[Patent reference 1]

JP,2001-142830,A (the 11 - 12th page, drawing 4)

[0006]

[Problem(s) to be Solved by the Invention]

The method of presentation which displays a title according to thread structure as a list of a document, and develops and omits a thread like drawing 10 mentioned above is mounted with much application. This method of presentation offered one solution from the point that the relation between documents can be grasped easily. Although the argument at this time and an exchange of e-mail are thread-ized and are kept by Document DB, in order to follow the flow of an exchange of an argument and mail afterwards,

they need to open each document according to an individual, and need to peruse the contents. However, in a Prior art, the contents of a document itself were not able to be developed on the same view as the thread of this document.

[0007]

That is, in the e-mail system which exchanges a document mutually through a network, or the notice plate system, a former document and its reply document have been treated as an independent document drawn up by user different, respectively. With such a system, it is ***** as relation in the document unit of [relation / between documents] a former document and a reply document. On the other hand, the contents of each document were treated by the document as an attribute of a proper, and even the relation of the contents between two or more documents was not taken into consideration. For this reason, although showing a user the relation between documents called a former document and a reply document also as terminal capabilities which make a document peruse was performed, showing the contents of those documents as a thing relevant to mutual was not performed. That is, it was not developed on the same view as the thread of a document as shows the contents of a document itself to drawing 10 . Consequently, each document needed to be opened according to the individual, the contents needed to be checked, and while actuation was complicated, for the user, the contents grasp which lets the whole pass was difficult, in order to check an exchange of an argument and mail later.

[0008]

Moreover, with the conventional technique indicated by the patent reference 1 mentioned above, the window of a chat is embedded into the related part in the document for a chat (for example, WORD document) (it is called support and related), and the technique displayed where an object and a chat are associated well is shown. However, even if it applies this technique, it is difficult to develop the contents of the document on the same view (the same window) as the thread of a document.

[0009]

On the other hand, the technique of showing a document as outline exists from the former, for example, is used with the word processor etc. However, this technique is outline-ized, and shows the document structure in a single document, and compounding a single document was not performed from two or more thread-ized sentence documents, such as a document mutually exchanged through the network.

[0010]

In the document mutually exchanged through the network, and the thread-ized document, the place which it is made in order that this invention may solve the above technical technical problems, and is made into the purpose is to make it possible to see the document of the required range to coincidence while grasping the relation between documents easily.

[0011]

[Means for Solving the Problem]

The basis of this purpose and this invention make it possible to obtain a virtual document which the document group in a thread is combined, a virtual document is generated, and the relation between documents can grasp easily by reflecting the relation between documents as relation between the sections in a virtual document in that case, and is looked at by coincidence only in the document of the required range. Namely, the document display system to which this invention is applied a group which minded the network and was carried out -- with a document storing means to store a document a group stored in this document storing means -- with a related information storing means to store the mutual related information in a document A display document generation means to read the related information stored in this related information storing means, to form a section group, to embed the document read from the document storing means to the predetermined section which constitutes this section group, and to generate a display document is included.

[0012]

Here, it can be characterized by for this display document generation means embedding the level showing the depth of the header of a document, and the hierarchy from a main sentence document, and forming a section group, and a related information storing means can be characterized by storing the information on the parent document related to a predetermined document.

[0013]

***** and the document display system to which this invention is applied from other viewpoints The message storage section which memorizes the message which constitutes a thread, and the index storage section which memorizes the information about the configuration of the thread in a message, The index of a message is taken out from this index storage section, and it has the display document generation function which generates the section corresponding to this index. A display document generation function It can be characterized by calling a predetermined message from the message storage section, embedding into a section, and adding to a display document.

[0014]

Moreover, it can be characterized by having further the expansion condition storage section which memorizes the expansion condition of a message, and for a display document generation function taking out the expansion condition of a message from the expansion condition storage section, and generating a section. Moreover, it can have further the user interactive-processing function to receive the expansion demand to the header from a user, and a display document generation function can be characterized by adding a predetermined message to a display document based on the expansion demand received by the user interactive-processing function.

[0015]

The document method of presentation with which this invention is applied on the other hand contains the step which acquires the related information between the documents in a thread from storage, the step which generates the section group based on the related information acquired from this storage in a virtual document, the step which reads the document corresponding to the predetermined section which constitutes this section group from storage, and the step which embeds the read document into a section and is added to a display document.

[0016]

Here, this section group can be characterized by being generated from the document group which minded the network and was carried out, and the document in this thread can be characterized by being the set of the document with which the edit to a document is not planned. Moreover, the step which acquires the related information between the documents in a thread can extract the relation of a document group as the tree structure, and it can be characterized by the step which generates a section group in a virtual document generating a section group using the extracted tree structure.

[0017]

Furthermore, ***** and the document method of presentation with which this invention is applied from other viewpoints The step which develops the header of a document in memory where the relation between documents is maintained while combining the document group which minded the network and was carried out, The step which develops in memory the document corresponding to the predetermined header developed by this memory where the relation between documents is maintained, and the step which outputs the contents developed by this memory as a display document are included. The step which is characterized by the step which develops the header of this document in memory more specifically generating a section group with the tree structure in a virtual document, and develops a document in memory can be characterized by developing the contents of the document corresponding to a predetermined section, where the tree structure is maintained.

[0018]

In addition, these invention can be grasped as a program which makes computers, such as servers, such as a notice plate server, and a mail client, realize each function. That is, the program to which this invention is applied is the function of storing the related information between documents in storage at a computer, the function which acquire the related information between the documents in a thread, the function which generate the section group based on the acquired related information in a virtual document, the function which read from storage the document corresponding to the predetermined section which constitutes this section group, and the function which embed the read document into a section and add to a display document.

The program to realize.

[0019]

The function the function which acquires the related information between the documents in this thread extracts the relation of a document group as the tree structure here, and the function which generates a section group in a virtual document generates the section group which has the extracted tree structure, and add this document to a display document is characterized by to add a document, where the tree structure is maintained.

[0020]

Furthermore, while the program to which this invention is applied combines the document group which minded the network and was used as it The function which develops in memory the document corresponding to the function which develops the header of a document in memory where the relation between documents is maintained, and the predetermined header developed by memory where the relation between documents is maintained, and the function which outputs the contents developed by memory as a display document are realized. The function which the function which develops the header of a document in memory more specifically generates a section group with the tree structure in a virtual document, and develops a document in memory can be characterized by developing the contents of the document corresponding to a predetermined section, where the tree structure is maintained.

[0021]

In addition, in case a computer is offered to a customer as these programs, the gestalt offered with the storage which memorized the program which a computer besides in the case of being provided in the condition of having been installed into the computer apparatus is made to execute possible [reading of a computer] can be considered. As this storage, a CD-ROM medium etc. corresponds, for example, with a CD-ROM reader etc., a program is read, and this program is stored and performed by the flash ROM etc. Moreover, these programs have the gestalt offered through a network for example, by program transmission equipment. As this program transmission equipment, it was prepared in the server on a network and has the memory which stores a program, and a program transmission means to offer a program through a network, for example.

[0022]

[Embodiment of the Invention]

Hereafter, with reference to an accompanying drawing, the gestalt of the operation to which this invention is applied is explained to a detail.

Drawing 1 is the whole block diagram having shown the document display system 1 to which the gestalt of this operation is applied. The server 10 which offers a display document is connected to the terminals (web browser etc.) 3 in which this document display system 1 is formed by computer apparatus, such as a personal computer (PC), through the networks 2, such as the Internet, and this terminal 3. As a document display system 1 shown in this drawing 1, a notice plate system corresponds, for example. In the notice plate system, the server 10 is managed by the computer apparatus (server KOMPITA) managed by the entrepreneur, and is carrying out are recording management of the message sent through a network 2 at the database.

Moreover, the contents of this database are offered to the terminal 3 which is the user computer to connect.

[0023]

A terminal 3 is a computer which are scattered in broader-based various places operated by the user. The user of a terminal 3 performs registration and perusal of a message (document) with a terminal 3. And the order [when the server 10 was accessed through the network 2 at, for example, the sponsor side of a notice plate generated from this terminal 3] activity which it applies and is the WWW page of a form is done. A user fills in the matters of requiring informational acquisition, such as a title of a notice plate, and transmits to a server 10 while he enters a user's individual humanity news (his e-mail address etc.) in the page. Moreover, with the gestalt of this operation, a user can demand the list display of a message from a terminal 3.

[0024]

A server 10 is a computer which carries out generalization management of the whole notice plate

system, and it connects with the networks 2, such as the Internet, and it is functioning as a WWW server and an email server. It is large and has the processing facility section 20 and the storage section 30. The processing facility section 20 is realized with the structure of CPU in a computer apparatus, main storage (memory), etc. Here, it has the message add function 23 which registers obtained messages, such as the display document generation function 22 which takes out the index of a message and generates a section with reference to the tree structure of a message as the user interactive-processing function 21 to receive the demand from the user who operates a terminal 3 through a network 2, and a display document generation means, and a response message. Here, a "section" means a settlement of a document and means one the "item unit" from a predetermined header to the following header. The semantics of the format of documents, such as column structure, is also included.

[0025]

In the display document generation function 22, the document group in a thread is combined and a virtual document is generated. Moreover, the relation between documents is made to reflect as relation between the sections in a virtual document in that case. This virtual document may be stored as a file on a hard disk drive (HDD) besides in the case of being developed by the memory in a computer apparatus. The generated virtual document was returned to the user interactive-processing function 21 as a display document, and the user interactive-processing function 21 has sent out this display document to the terminal 3.

[0026]

The storage section 30 is a database managed by the server 10, for example, is constituted by external storage, such as a hard disk drive (HDD). Here, it has the index storage section 33 in which index information on a message, such as information on the parent message to a predetermined title, is stored as the message storage section 32 and the related information storing means which the contents of the actual message are stored as the expansion condition storage section 31 which memorizes expansion conditions, such as existence of the message according to a header, and a document storing means.

[0027]

Drawing 2 (a) - (c) is drawing having shown the example of each information stored to the storage section 30. Drawing 2 (a) shows the contents recorded in the expansion condition storage section 31, and the contents on which drawing 2 (b) is recorded in the message storage section 32, and drawing 2 (c) show the contents recorded in the index storage section 33. In the expansion condition storage section 31, as shown in drawing 2 (a), it matches with identification information (ID) and the existence (Y/N) of expansion of a header and the existence (Y/N) of expansion of a message are recorded. In the message storage section 32, as shown in drawing 2 (b), it matches with identification information (ID) and the contents of the acquired message itself are stored. In the index storage section 33, as shown in drawing 2 (c), it matches with identification information (ID) and the relation between a title and parent message ID is recorded. About this title, the structure between documents constitutes the tree structure for the response [the Maine TOPICS and its classification, and] of what position it is, an answerback number, etc., for example.

[0028]

The structure of the thread in the document group by which the index stored in this index storage section 33 was thread-ized is shown. Here, it can be said to be a thing like the small notice plate for speaking about a series of writing about specific subject, and a certain common theme with a "thread." The "thread" of a message displays intelligibly the relation between the message which becomes origin, and the message which answered a letter to it. It becomes easy to understand that this thread is considered like "parent and child." A "child" message is born to a "parent" message by answering a letter to it. When the reply to a parent message becomes plurality, it can be considered that all of those reply messages are "twin" relation.

[0029]

Next, the procedure in the document display system 1 is explained.

Drawing 3 is the flow chart which showed processing of the document method of presentation in which the gestalt of this operation was applied. This flow chart explains as flow of a series of processings of

processing with a terminal 3 and a server 10. First, a user demands a message list display from a terminal 3 (step 101). In a server 10, the user interactive-processing function 21 receives this demand (step 102), and requires generation of a display document from the display document generation function 22. The display document generation function 22 performs generation processing of a display document using the information stored in the expansion condition storage section 31 and the message storage section 32, and the index storage section 33 (step 103). Then, from the display document generation function 22, the generated display document is returned to the user interactive-processing function 21, and the user interactive-processing function 21 transmits this display document to a terminal 3 through a network 2 (step 104).

[0030]

At a terminal 3, a display document is received (step 105), for example, a screen display is carried out to a display by its browser. Expansion of a specific section or directions of folding is performed by the user to the display document outputted to the display using a terminal 3 (step 106). In a server 10, the user interactive-processing function 21 receives this demand through a network 2 (step 107), and updates the expansion condition stored in the expansion condition storage section 31 (step 108). Moreover, the user interactive-processing function 21 requires generation of a display document from the display document generation function 22, and generates a display document in the display document generation function 22 based on the updated expansion condition (step 109). Then, from the display document generation function 22, the generated display document is returned to the user interactive-processing function 21, and the user interactive-processing function 21 transmits the output of the display document with which the specific section was developed or folded up, i.e., this display document, to a terminal 3 through a network 2 (step 110).

[0031]

At a terminal 3, the screen output of the display document which received the display document (step 111), for example, was received by its browser is carried out. Then, decision of being the need is made for expansion and folding of a section (step 112), and to step 106, processing is completed to return, and in being required, in not being required, it completes it. In addition, these processings of a series of are performed by the application program of the server 10 which is a computer apparatus.

[0032]

Next, generation processing of a display document is explained using drawing 4 and drawing 5.

Drawing 4 is the flow chart which showed the generation processing of the display document performed by the display document generation function 22 shown in steps 103 and 109 of drawing 3. Moreover, drawing 5 (a) - (c) is an explanatory view for explaining generation processing of a display document. In the display document generation function 22, first, an index is taken out from the index storage section 33 (step 201), and a message is taken out from the message storage section 32 (step 202). From the contents of the index storage section 33 shown in drawing 2 (c), the relation between the extracted documents can understand that it is the tree structure as shown in drawing 5 (a).

[0033]

Next, the section corresponding to an index is generated (step 203). In generation of this section, a header and level (depth of the tree structure from the main message) are first embedded into a section (step 211). Here, as shown in drawing 5 (b), the section group corresponding to the tree structure extracted in the virtual document is generated, for example. Next, the icon for actuation is embedded into a section (step 212).

As an example of the icon for actuation, there is a thing as shown in drawing 5 (c). The icon for actuation of a rightward triangle expresses the omitted thread, and the icon for actuation of a downward triangle expresses the developed thread. Moreover, the icon for actuation on which "+" is drawn shows that the contents of the text are not developed, and the icon for actuation on which "-" is drawn means that the contents of the text are developed. By such an icon for actuation being prepared, the user of a terminal 3 becomes possible [directing expansion or folding of a specific section]. In addition, these user interfaces can consider various variations. For example, it is all also possible expansion and to all add functions, such as folding.

[0034]

Then, in the display document generation function 22, the expansion condition of the corresponding message is taken out from the expansion condition storage section 31 (step 213). Directions of the expansion or folding based on the actuation of a user of the icon for actuation mentioned above in this expansion condition storage section 31 are developed, and the information on being finishing [expansion] is stored corresponding to ID of a document.

From the read expansion condition, when finishing [expansion], the display document generation function 22 takes out a message from the message storage section 32, and embeds it into a section (step 214).

[0035]

Thus, after the section corresponding to an index is generated, the display document generation function 22 adds the generated section to a display document (step 204). When an expansion condition has not been developed at this time, from it, the section generation to a low-ranking response message is closed (step 205), and generation processing of a display document is completed. In addition, as this display document, it should be HTML-ized, for example.

[0036]

Drawing 6 is drawing having shown the example of a thread display of the virtual document generated by doing in this way. Here, it is expressed as the display device corresponding to the abbreviation of a section, and expansion.

By this, while the relation between documents can grasp easily, a display which is seen only in the document of the required range at coincidence is attained. In addition, it is not necessary to make it exist statically, and the text of each document can also not necessarily have a pointer (ID) to the text of the document in the original document database (message storage section 32) from the index information on a virtual document in a virtual document. Moreover, the virtual document itself does not need to be the permanent file which exists on HDD, and it can also be realized as an object temporarily generated on memory.

[0037]

In addition, although processing of expansion and an abbreviation of a section was performed by the server 10 side in explanation to ****, it is also possible to control processing of expansion and an abbreviation of this section by the terminal 3 side. It is the same as that of **** till the place which embeds a section in a virtual document by this case 10, for example, server, side based on the dependency of a message. However, in a server 10 side, expansion / abbreviation condition on a display shall not be managed. That is, at the time of the embedding of a section, all the messages of the thread of the range for perusal are embedded as a section in a virtual document. Expansion and an abbreviation of a section perform [of the section which the user specified by the terminal 3 side / a display and] by controlling whether it is non-display. It becomes possible to control a display and un-displaying by this configuration by making full use of JavaScript, when using the terminal capabilities incorporating a display and non-display function of a section, or even when a web browser is used as a terminal 3. [of a section]

[0038]

Next, the gestalt of this operation is explained using the concrete example of a document.

Drawing 7 is drawing having shown the example of the list list in a document title. The document dealt with here is a document mutually exchanged through the network 2, and the document of a thread is identified by the header which is a document title. A triangle is an icon for actuation, and the response document to each document exists and it shows that it is thread-ized. Here, the case where he wants to peruse the document of the thread which begins from "development planning of Product A" is considered. By the conventional approach, each document needed to be chosen and it needed to display one document at a time. Although it was possible in the former to have opened two or more windows and to have displayed two or more documents at once, since the number of windows which can be displayed at once on a display had a practical limit, when the number of documents increased, it closes a current display document and needed to redisplay a new document. In this, actuation becomes

complicated and thinking will break off for migration between documents. Furthermore, it is also difficult to grasp the relation between the documents displayed on the window. That is, it was difficult to foresee the whole thread and to grasp the contents by the conventional approach.

[0039]

On the other hand, with the gestalt of this operation, it makes it possible to peruse the thread of a document, and the contents of the document with the same view.

Drawing 8 is drawing having shown the example of perusal of the compounded contents of a document. This drawing 8 shows the example displayed in case the document of the thread of drawing 7 is perused. For example, it is possible the thing which is a root document in the window of drawing 7 and for which "development planning of Product A" is choose, and an "all display" carbon button is push and display, and to display all documents (include about "the operation plan of the first half" and "correspondence to a production adjustment request") in a form as show in drawing 8 from the beginning, and to also make even expansion of the contents perform on the same view.

[0040]

Moreover, in the example shown in drawing 8, expansion of the contents of the document and expansion of a document thread shall be specified independently. For example, although the thread of the response document of the document will be developed if a "thread expansion" carbon button is pushed, the contents of a document itself are not developed. A push on a "contents expansion" carbon button develops and displays the contents (an addresser, time, text) of the document. For this reason, predetermined semantics is given to the icon which shows an expansion condition as shown in drawing 5 (c). As mentioned above, such composition is performing mapping between a virtual document and a stereo document, and becomes possible [realizing].

[0041]

In addition, although the notice plate system was mentioned as the example and the explanation from drawing 1 explained it as a document display system 1, it is applicable also like an e-mail system. Drawing 9 is drawing having shown functional block of an e-mail system with which the gestalt of this operation is applied. The server 10 shown in drawing 1 corresponds to a mail client 11, and is performing transmission and reception of a mail server 4 and a message instead of the terminal 3 shown in drawing 1. The mail client 11 shown in the server 10 shown in drawing 1 and drawing 9 is fundamentally the same if the point that the transceiver function of a message is added is removed.

[0042]

The processing-facility section 20 of the mail client 11 shown in drawing 9 is equipped with the screen-display function 27 which carries out a screen display of this display document as the output section of the display document generated by the display document generation function 22 with the directions from the message reception function 25 to receive a message through a network 2 from a mail server 4, the message-sending function 26 transmit a message to a mail server 4, and the user interactive-processing function 21. Each component of the expansion condition storage section 31 in the storage section 30, the message storage section 32, and the index storage section 33 is the same as that of what was shown in drawing 1. Since e-mail is downloaded and managed to a mail client 11 in many cases in the case of an e-mail system, apart from drawing 1, it has such a configuration. In addition, when what uses a web browser exists as a client, it becomes the form where a network 2 exists between the screen-display function 27 and the user interactive-processing function 21. Also at this case, there is no modification in the functional block itself.

[0043]

As mentioned above, as explained in full detail, with the gestalt of this operation, a virtual document which can combine the document group in a thread, can generate a virtual document, and can grasp the relation between documents easily by reflecting the relation between documents as relation between the sections in a virtual document in that case, and is looked at by coincidence only in the document of the required range can be obtained. More specifically the relation of the document group in a thread is extracted as the tree structure, the section group which has the tree structure same in a virtual document as origin for this is generated, and related mapping between documents is performed. Then, the contents

of the document corresponding to each section are mapped and displayed. Thus, the structure which maps two or more sentence document in one virtual document is offered with the gestalt of this operation. The relation between the independent documents can be virtually map in one document , without developing the text of the document of a high order , even if it be a case as deal with as an object which be characterize by not the list of documents but the compounded contents of a virtual document itself being in sight as for a display with the gestalt of this operation and by which the section be embedded in the text of a high order as an embedded structure .

[0044]

[Effect of the Invention]

As explained above, according to this invention, it becomes possible to be able to grasp the relation between the documents of the thread-ized document easily, and to see the document of the required range to coincidence.

[Brief Description of the Drawings]

[Drawing 1] It is the whole block diagram having shown the document display system to which the gestalt of this operation is applied.

[Drawing 2] (a) - (c) is drawing having shown the example of each information stored to the storage section.

[Drawing 3] It is the flow chart which showed processing of the document method of presentation in which the gestalt of this operation was applied.

[Drawing 4] It is the flow chart which showed the generation processing of the display document performed by the display document generation function shown in steps 103 and 109 of drawing 3 .

[Drawing 5] (a) - (c) is an explanatory view for explaining generation processing of a display document.

[Drawing 6] It is drawing having shown the example of a thread display of the generated virtual document.

[Drawing 7] It is drawing having shown the example of the list list in a document title.

[Drawing 8] It is drawing having shown the example of perusal of the compounded contents of a document.

[Drawing 9] It is drawing having shown functional block of an e-mail system with which the gestalt of this operation is applied.

[Drawing 10] It is drawing having shown the example of a display of the document group which constitutes a thread.

[Description of Notations]

1 [-- A server, 20 / -- The processing facility section, 21 / -- A user interactive-processing function, 22 / -- A display document generation function 23 / -- A message add function, 25 / -- A message reception function, 26 / -- A message-sending function, 27 / -- A screen-display function, 30 / -- The storage section, 31 / -- The expansion condition storage section 32 / -- The message storage section, 33 / -- Index storage section] -- A document display system, 2 -- A network, 3 -- Terminals (web browser etc.), 10

[Translation done.]

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TECHNICAL FIELD

[Field of the Invention]

This invention relates to the document display system which displays the thread-ized document group in more detail about the document display system which displays a document.

[0002]

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PRIOR ART

[Description of the Prior Art]

In the e-mail system which exchanges a document through a network, or the notice plate system, threading the document obtained by the exchange of an argument and mail, and keeping it in a document database (DB) is performed widely. At this time, according to the structure of a thread, a title is displayed as a list of a document, and the method of presentation which develops and omits a thread is mounted with much application.

[0003]

Drawing 10 is drawing having shown the example of a display of the document group which constitutes a thread. Here, to the Maine TOPICS, there are answerback (response) 1 and answerback (response) 2, there is answerback 1-1 as answerback of answerback, and there are answerback 1-1-1 and answerback 1-1-2 as this answerback 1-1 as that answerback at this answerback 1. Moreover, there is answerback 2-1 among the answerbacks 2 as answerback of this answerback. Thus, the document list in a thread is displayed by the tree structure (tree structure) in the system which exchanges a document through a network.

[0004]

As a conventional technique, for example, in order to support the synchronization by individual human being who is not located in the same location, and asynchronous communication, to make it connected with arch FEKUTO as the background for a communication link and to make a communication link possible the window of a chat is embedded into the related part in the document for a chat, and the technique which carries out support of the communication link client to the location of the arbitration in arch FEKUTO, the related location, for example, the word processor document, in a document, exists (for example, patent reference 1 reference --) .

[0005]

[Patent reference 1]

JP,2001-142830,A (the 11 - 12th page, drawing 4)

[0006]

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EFFECT OF THE INVENTION

[Effect of the Invention]

As explained above, according to this invention, it becomes possible to be able to grasp the relation between the documents of the thread-ized document easily, and to see the document of the required range to coincidence.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention]

The method of presentation which displays a title according to thread structure as a list of a document, and develops and omits a thread like drawing 10 mentioned above is mounted with much application. This method of presentation offered one solution from the point that the relation between documents can be grasped easily. Although the argument at this time and an exchange of e-mail are thread-ized and are kept by Document DB, in order to follow the flow of an exchange of an argument and mail afterwards, they need to open each document according to an individual, and need to peruse the contents. However, in a Prior art, the contents of a document itself were not able to be developed on the same view as the thread of this document.

[0007]

That is, in the e-mail system which exchanges a document mutually through a network, or the notice plate system, a former document and its reply document have been treated as an independent document drawn up by user different, respectively. With such a system, it is ***** as relation in the document unit of [relation / between documents] a former document and a reply document. On the other hand, the contents of each document were treated by the document as an attribute of a proper, and even the relation of the contents between two or more documents was not taken into consideration. For this reason, although showing a user the relation between documents called a former document and a reply document also as terminal capabilities which make a document peruse was performed, showing the contents of those documents as a thing relevant to mutual was not performed. That is, it was not developed on the same view as the thread of a document as shows the contents of a document itself to drawing 10 . Consequently, each document needed to be opened according to the individual, the contents needed to be checked, and while actuation was complicated, for the user, the contents grasp which lets the whole pass was difficult, in order to check an exchange of an argument and mail later.

[0008]

Moreover, with the conventional technique indicated by the patent reference 1 mentioned above, the window of a chat is embedded into the related part in the document for a chat (for example, WORD document) (it is called support and related), and the technique displayed where an object and a chat are associated well is shown. However, even if it applies this technique, it is difficult to develop the contents of the document on the same view (the same window) as the thread of a document.

[0009]

On the other hand, the technique of showing a document as outline exists from the former, for example, is used with the word processor etc. However, this technique is outline-ized, and shows the document structure in a single document, and compounding a single document was not performed from two or more thread-ized sentence documents, such as a document mutually exchanged through the network.

[0010]

In the document mutually exchanged through the network, and the thread-ized document, the place which it is made in order that this invention may solve the above technical technical problems, and is made into the purpose is to make it possible to see the document of the required range to coincidence

while grasping the relation between documents easily.
[0011]

[Translation done.]

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MEANS

[Means for Solving the Problem]

The basis of this purpose and this invention make it possible to obtain a virtual document which the document group in a thread is combined, a virtual document is generated, and the relation between documents can grasp easily by reflecting the relation between documents as relation between the sections in a virtual document in that case, and is looked at by coincidence only in the document of the required range. Namely, the document display system to which this invention is applied a group which minded the network and was carried out -- with a document storing means to store a document a group stored in this document storing means -- with a related information storing means to store the mutual related information in a document A display document generation means to read the related information stored in this related information storing means, to form a section group, to embed the document read from the document storing means to the predetermined section which constitutes this section group, and to generate a display document is included.

[0012]

Here, it can be characterized by for this display document generation means embedding the level showing the depth of the header of a document, and the hierarchy from a main sentence document, and forming a section group, and a related information storing means can be characterized by storing the information on the parent document related to a predetermined document.

[0013]

***** and the document display system to which this invention is applied from other viewpoints The message storage section which memorizes the message which constitutes a thread, and the index storage section which memorizes the information about the configuration of the thread in a message, The index of a message is taken out from this index storage section, and it has the display document generation function which generates the section corresponding to this index. A display document generation function It can be characterized by calling a predetermined message from the message storage section, embedding into a section, and adding to a display document.

[0014]

Moreover, it can be characterized by having further the expansion condition storage section which memorizes the expansion condition of a message, and for a display document generation function taking out the expansion condition of a message from the expansion condition storage section, and generating a section. Moreover, it can have further the user interactive-processing function to receive the expansion demand to the header from a user, and a display document generation function can be characterized by adding a predetermined message to a display document based on the expansion demand received by the user interactive-processing function.

[0015]

The document method of presentation with which this invention is applied on the other hand contains the step which acquires the related information between the documents in a thread from storage, the step which generates the section group based on the related information acquired from this storage in a virtual document, the step which reads the document corresponding to the predetermined section which

constitutes this section group from storage, and the step which embeds the read document into a section and is added to a display document.

[0016]

Here, this section group can be characterized by being generated from the document group which minded the network and was carried out, and the document in this thread can be characterized by being the set of the document with which the edit to a document is not planned. Moreover, the step which acquires the related information between the documents in a thread can extract the relation of a document group as the tree structure, and it can be characterized by the step which generates a section group in a virtual document generating a section group using the extracted tree structure.

[0017]

Furthermore, ***** and the document method of presentation with which this invention is applied from other viewpoints The step which develops the header of a document in memory where the relation between documents is maintained while combining the document group which minded the network and was carried out, The step which develops in memory the document corresponding to the predetermined header developed by this memory where the relation between documents is maintained, and the step which outputs the contents developed by this memory as a display document are included. The step which is characterized by the step which develops the header of this document in memory more specifically generating a section group with the tree structure in a virtual document, and develops a document in memory can be characterized by developing the contents of the document corresponding to a predetermined section, where the tree structure is maintained.

[0018]

In addition, these invention can be grasped as a program which makes computers, such as servers, such as a notice plate server, and a mail client, realize each function. That is, the program to which this invention is applied is the function of storing the related information between documents in storage at a computer, the function which acquire the related information between the documents in a thread, the function which generate the section group based on the acquired related information in a virtual document, the function which read from storage the document corresponding to the predetermined section which constitutes this section group, and the function which embed the read document into a section and add to a display document.

The program to realize.

[0019]

The function the function which acquires the related information between the documents in this thread extracts the relation of a document group as the tree structure here, and the function which generates a section group in a virtual document generates the section group which has the extracted tree structure, and add this document to a display document is characterized by to add a document, where the tree structure is maintained.

[0020]

Furthermore, while the program to which this invention is applied combines the document group which minded the network and was used as it The function which develops in memory the document corresponding to the function which develops the header of a document in memory where the relation between documents is maintained, and the predetermined header developed by memory where the relation between documents is maintained, and the function which outputs the contents developed by memory as a display document are realized. The function which the function which develops the header of a document in memory more specifically generates a section group with the tree structure in a virtual document, and develops a document in memory can be characterized by developing the contents of the document corresponding to a predetermined section, where the tree structure is maintained.

[0021]

In addition, in case a computer is offered to a customer as these programs, the gestalt offered with the storage which memorized the program which a computer besides in the case of being provided in the condition of having been installed into the computer apparatus is made to execute possible [reading of a computer] can be considered. As this storage, a CD-ROM medium etc. corresponds, for example, with a

CD-ROM reader etc., a program is read, and this program is stored and performed by the flash ROM etc. Moreover, these programs have the gestalt offered through a network for example, by program transmission equipment. As this program transmission equipment, it was prepared in the server on a network and has the memory which stores a program, and a program transmission means to offer a program through a network, for example.

[0022]

[Embodiment of the Invention]

Hereafter, with reference to an accompanying drawing, the gestalt of the operation to which this invention is applied is explained to a detail.

Drawing 1 is the whole block diagram having shown the document display system 1 to which the gestalt of this operation is applied. The server 10 which offers a display document is connected to the terminals (web browser etc.) 3 in which this document display system 1 is formed by computer apparatus, such as a personal computer (PC), through the networks 2, such as the Internet, and this terminal 3. As a document display system 1 shown in this drawing 1, a notice plate system corresponds, for example. In the notice plate system, the server 10 is managed by the computer apparatus (server KOMPITA) managed by the entrepreneur, and is carrying out are recording management of the message sent through a network 2 at the database.

Moreover, the contents of this database are offered to the terminal 3 which is the user computer to connect.

[0023]

A terminal 3 is a computer which are scattered in broader-based various places operated by the user. The user of a terminal 3 performs registration and perusal of a message (document) with a terminal 3.

And the order [when the server 10 was accessed through the network 2 at, for example, the sponsor side of a notice plate generated from this terminal 3] activity which it applies and is the WWW page of a form is done. A user fills in the matters of requiring informational acquisition, such as a title of a notice plate, and transmits to a server 10 while he enters a user's individual humanity news (his e-mail address etc.) in the page. Moreover, with the gestalt of this operation, a user can demand the list display of a message from a terminal 3.

[0024]

A server 10 is a computer which carries out generalization management of the whole notice plate system, and it connects with the networks 2, such as the Internet, and it is functioning as a WWW server and an email server. It is large and has the processing facility section 20 and the storage section 30. The processing facility section 20 is realized with the structure of CPU in a computer apparatus, main storage (memory), etc. Here, it has the message add function 23 which registers obtained messages, such as the display document generation function 22 which takes out the index of a message and generates a section with reference to the tree structure of a message as the user interactive-processing function 21 to receive the demand from the user who operates a terminal 3 through a network 2, and a display document generation means, and a response message. Here, a "section" means a settlement of a document and means one the "item unit" from a predetermined header to the following header. The semantics of the format of documents, such as column structure, is also included.

[0025]

In the display document generation function 22, the document group in a thread is combined and a virtual document is generated. Moreover, the relation between documents is made to reflect as relation between the sections in a virtual document in that case. This virtual document may be stored as a file on a hard disk drive (HDD) besides in the case of being developed by the memory in a computer apparatus. The generated virtual document was returned to the user interactive-processing function 21 as a display document, and the user interactive-processing function 21 has sent out this display document to the terminal 3.

[0026]

The storage section 30 is a database managed by the server 10, for example, is constituted by external storage, such as a hard disk drive (HDD). Here, it has the index storage section 33 in which index

information on a message, such as information on the parent message to a predetermined title, is stored as the message storage section 32 and the related information storing means which the contents of the actual message are stored as the expansion condition storage section 31 which memorizes expansion conditions, such as existence of the message according to a header, and a document storing means.

[0027]

Drawing 2 (a) - (c) is drawing having shown the example of each information stored to the storage section 30. Drawing 2 (a) shows the contents recorded in the expansion condition storage section 31, and the contents on which drawing 2 (b) is recorded in the message storage section 32, and drawing 2 (c) show the contents recorded in the index storage section 33. In the expansion condition storage section 31, as shown in drawing 2 (a), it matches with identification information (ID) and the existence (Y/N) of expansion of a header and the existence (Y/N) of expansion of a message are recorded. In the message storage section 32, as shown in drawing 2 (b), it matches with identification information (ID) and the contents of the acquired message itself are stored. In the index storage section 33, as shown in drawing 2 (c), it matches with identification information (ID) and the relation between a title and parent message ID is recorded. About this title, the structure between documents constitutes the tree structure for the response [the Maine TOPICS and its classification, and] of what position it is, an answerback number, etc., for example.

[0028]

The structure of the thread in the document group by which the index stored in this index storage section 33 was thread-ized is shown. Here, it can be said to be a thing like the small notice plate for speaking about a series of writing about specific subject, and a certain common theme with a "thread." The "thread" of a message displays intelligibly the relation between the message which becomes origin, and the message which answered a letter to it. It becomes easy to understand that this thread is considered like "parent and child." A "child" message is born to a "parent" message by answering a letter to it. When the reply to a parent message becomes plurality, it can be considered that all of those reply messages are "twin" relation.

[0029]

Next, the procedure in the document display system 1 is explained.

Drawing 3 is the flow chart which showed processing of the document method of presentation in which the gestalt of this operation was applied. This flow chart explains as flow of a series of processings of processing with a terminal 3 and a server 10. First, a user demands a message list display from a terminal 3 (step 101). In a server 10, the user interactive-processing function 21 receives this demand (step 102), and requires generation of a display document from the display document generation function 22. The display document generation function 22 performs generation processing of a display document using the information stored in the expansion condition storage section 31 and the message storage section 32, and the index storage section 33 (step 103). Then, from the display document generation function 22, the generated display document is returned to the user interactive-processing function 21, and the user interactive-processing function 21 transmits this display document to a terminal 3 through a network 2 (step 104).

[0030]

At a terminal 3, a display document is received (step 105), for example, a screen display is carried out to a display by its browser. Expansion of a specific section or directions of folding is performed by the user to the display document outputted to the display using a terminal 3 (step 106). In a server 10, the user interactive-processing function 21 receives this demand through a network 2 (step 107), and updates the expansion condition stored in the expansion condition storage section 31 (step 108). Moreover, the user interactive-processing function 21 requires generation of a display document from the display document generation function 22, and generates a display document in the display document generation function 22 based on the updated expansion condition (step 109). Then, from the display document generation function 22, the generated display document is returned to the user interactive-processing function 21, and the user interactive-processing function 21 transmits the output of the display document with which the specific section was developed or folded up, i.e., this display document, to a terminal 3 through a

network 2 (step 110).

[0031]

At a terminal 3, the screen output of the display document which received the display document (step 111), for example, was received by its browser is carried out. Then, decision of being the need is made for expansion and folding of a section (step 112), and to step 106, processing is completed to return, and in being required, in not being required, it completes it. In addition, these processings of a series of are performed by the application program of the server 10 which is a computer apparatus.

[0032]

Next, generation processing of a display document is explained using drawing 4 and drawing 5.

Drawing 4 is the flow chart which showed the generation processing of the display document performed by the display document generation function 22 shown in steps 103 and 109 of drawing 3. Moreover, drawing 5 (a) - (c) is an explanatory view for explaining generation processing of a display document. In the display document generation function 22, first, an index is taken out from the index storage section 33 (step 201), and a message is taken out from the message storage section 32 (step 202). From the contents of the index storage section 33 shown in drawing 2 (c), the relation between the extracted documents can understand that it is the tree structure as shown in drawing 5 (a).

[0033]

Next, the section corresponding to an index is generated (step 203). In generation of this section, a header and level (depth of the tree structure from the main message) are first embedded into a section (step 211). Here, as shown in drawing 5 (b), the section group corresponding to the tree structure extracted in the virtual document is generated, for example. Next, the icon for actuation is embedded into a section (step 212).

As an example of the icon for actuation, there is a thing as shown in drawing 5 (c). The icon for actuation of a rightward triangle expresses the omitted thread, and the icon for actuation of a downward triangle expresses the developed thread. Moreover, the icon for actuation on which "+" is drawn shows that the contents of the text are not developed, and the icon for actuation on which "-" is drawn means that the contents of the text are developed. By such an icon for actuation being prepared, the user of a terminal 3 becomes possible [directing expansion or folding of a specific section]. In addition, these user interfaces can consider various variations. For example, it is all also possible expansion and to all add functions, such as folding.

[0034]

Then, in the display document generation function 22, the expansion condition of the corresponding message is taken out from the expansion condition storage section 31 (step 213). Directions of the expansion or folding based on the actuation of a user of the icon for actuation mentioned above in this expansion condition storage section 31 are developed, and the information on being finishing [expansion] is stored corresponding to ID of a document.

From the read expansion condition, when finishing [expansion], the display document generation function 22 takes out a message from the message storage section 32, and embeds it into a section (step 214).

[0035]

Thus, after the section corresponding to an index is generated, the display document generation function 22 adds the generated section to a display document (step 204). When an expansion condition has not been developed at this time, from it, the section generation to a low-ranking response message is closed (step 205), and generation processing of a display document is completed. In addition, as this display document, it should be HTML-ized, for example.

[0036]

Drawing 6 is drawing having shown the example of a thread display of the virtual document generated by doing in this way. Here, it is expressed as the display device corresponding to the abbreviation of a section, and expansion.

By this, while the relation between documents can grasp easily, a display which is seen only in the document of the required range at coincidence is attained. In addition, it is not necessary to make it exist

statically, and the text of each document can also not necessarily have a pointer (ID) to the text of the document in the original document database (message storage section 32) from the index information on a virtual document in a virtual document. Moreover, the virtual document itself does not need to be the permanent file which exists on HDD, and it can also be realized as an object temporarily generated on memory.

[0037]

In addition, although processing of expansion and an abbreviation of a section was performed by the server 10 side in explanation to ****, it is also possible to control processing of expansion and an abbreviation of this section by the terminal 3 side. It is the same as that of **** till the place which embeds a section in a virtual document by this case 10, for example, server, side based on the dependency of a message. However, in a server 10 side, expansion / abbreviation condition on a display shall not be managed. That is, at the time of the embedding of a section, all the messages of the thread of the range for perusal are embedded as a section in a virtual document. Expansion and an abbreviation of a section perform [of the section which the user specified by the terminal 3 side / a display and] by controlling whether it is non-display. It becomes possible to control a display and un-displaying by this configuration by making full use of JavaScript, when using the terminal capabilities incorporating a display and non-display function of a section, or even when a web browser is used as a terminal 3. [of a section]

[0038]

Next, the gestalt of this operation is explained using the concrete example of a document.

Drawing 7 is drawing having shown the example of the list list in a document title. The document dealt with here is a document mutually exchanged through the network 2, and the document of a thread is identified by the header which is a document title. A triangle is an icon for actuation, and the response document to each document exists and it shows that it is thread-ized. Here, the case where he wants to peruse the document of the thread which begins from "development planning of Product A" is considered. By the conventional approach, each document needed to be chosen and it needed to display one document at a time. Although it was possible in the former to have opened two or more windows and to have displayed two or more documents at once, since the number of windows which can be displayed at once on a display had a practical limit, when the number of documents increased, it closes a current display document and needed to redisplay a new document. In this, actuation becomes complicated and thinking will break off for migration between documents. Furthermore, it is also difficult to grasp the relation between the documents displayed on the window. That is, it was difficult to foresee the whole thread and to grasp the contents by the conventional approach.

[0039]

On the other hand, with the gestalt of this operation, it makes it possible to peruse the thread of a document, and the contents of the document with the same view.

Drawing 8 is drawing having shown the example of perusal of the compounded contents of a document. This drawing 8 shows the example displayed in case the document of the thread of drawing 7 is perused. For example, it is possible the thing which is a root document in the window of drawing 7 and for which "development planning of Product A" is choose, and an "all display" carbon button is push and display, and to display all documents (include about "the operation plan of the first half" and "correspondence to a production adjustment request") in a form as show in drawing 8 from the beginning, and to also make even expansion of the contents perform on the same view.

[0040]

Moreover, in the example shown in drawing 8, expansion of the contents of the document and expansion of a document thread shall be specified independently. For example, although the thread of the response document of the document will be developed if a "thread expansion" carbon button is pushed, the contents of a document itself are not developed. A push on a "contents expansion" carbon button develops and displays the contents (an addresser, time, text) of the document. For this reason, predetermined semantics is given to the icon which shows an expansion condition as shown in drawing 5 (c). As mentioned above, such composition is performing mapping between a virtual document and a

stereo document, and becomes possible [realizing].

[0041]

In addition, although the notice plate system was mentioned as the example and the explanation from drawing 1 explained it as a document display system 1, it is applicable also like an e-mail system.

Drawing 9 is drawing having shown functional block of an e-mail system with which the gestalt of this operation is applied. The server 10 shown in drawing 1 corresponds to a mail client 11, and is performing transmission and reception of a mail server 4 and a message instead of the terminal 3 shown in drawing 1. The mail client 11 shown in the server 10 shown in drawing 1 and drawing 9 is fundamentally the same if the point that the transceiver function of a message is added is removed.

[0042]

The processing-facility section 20 of the mail client 11 shown in drawing 9 is equipped with the screen-display function 27 which carries out a screen display of this display document as the output section of the display document generated by the display document generation function 22 with the directions from the message reception function 25 to receive a message through a network 2 from a mail server 4, the message-sending function 26 transmit a message to a mail server 4, and the user interactive-processing function 21. Each component of the expansion condition storage section 31 in the storage section 30, the message storage section 32, and the index storage section 33 is the same as that of what was shown in drawing 1. Since e-mail is downloaded and managed to a mail client 11 in many cases in the case of an e-mail system, apart from drawing 1, it has such a configuration. In addition, when what uses a web browser exists as a client, it becomes the form where a network 2 exists between the screen-display function 27 and the user interactive-processing function 21. Also at this case, there is no modification in the functional block itself.

[0043]

As mentioned above, as explained in full detail, with the gestalt of this operation, a virtual document which can combine the document group in a thread, can generate a virtual document, and can grasp the relation between documents easily by reflecting the relation between documents as relation between the sections in a virtual document in that case, and is looked at by coincidence only in the document of the required range can be obtained. More specifically the relation of the document group in a thread is extracted as the tree structure, the section group which has the tree structure same in a virtual document as origin for this is generated, and related mapping between documents is performed. Then, the contents of the document corresponding to each section are mapped and displayed. Thus, the structure which maps two or more sentence document in one virtual document is offered with the gestalt of this operation. The relation between the independent documents can be virtually map in one document, without developing the text of the document of a high order, even if it be a case as deal with as an object which be characterize by not the list of documents but the compounded contents of a virtual document itself being in sight as for a display with the gestalt of this operation and by which the section be embedded in the text of a high order as an embedded structure.

[0044]

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the whole block diagram having shown the document display system to which the gestalt of this operation is applied.

[Drawing 2] (a) - (c) is drawing having shown the example of each information stored to the storage section.

[Drawing 3] It is the flow chart which showed processing of the document method of presentation in which the gestalt of this operation was applied.

[Drawing 4] It is the flow chart which showed the generation processing of the display document performed by the display document generation function shown in steps 103 and 109 of drawing 3 .

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[Drawing 9] It is drawing having shown functional block of an e-mail system with which the gestalt of this operation is applied.

[Drawing 10] It is drawing having shown the example of a display of the document group which constitutes a thread.

[Description of Notations]

1 [-- A server, 20 / -- The processing facility section, 21 / -- A user interactive-processing function, 22 / -- A display document generation function 23 / -- A message add function, 25 / -- A message reception function, 26 / -- A message-sending function, 27 / -- A screen-display function, 30 / -- The storage section, 31 / -- The expansion condition storage section 32 / -- The message storage section, 33 / -- Index storage section] -- A document display system, 2 -- A network, 3 -- Terminals (web browser etc.), 10

[Translation done.]